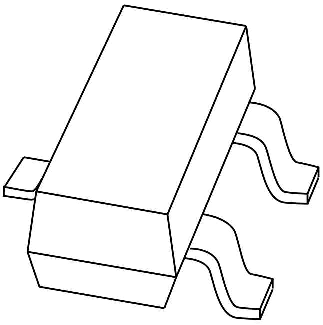
DATA SHEET



PBSS5350T
50 V, 3 A
PNP low V_{CEsat} (BISS) transistor

Product specification
Supersedes data of 2002 Aug 08

2004 Jan 13

Philips Semiconductors

PHILIPS

50 V, 3 A PNP low V_{CEsat} (BISS) transistor

PBSS5350T

FEATURES

- Low collector-emitter saturation voltage V_{CEsat} and corresponding low R_{CEsat}
- High collector current capability
- High collector current gain
- Improved efficiency due to reduced heat generation.

APPLICATIONS

- Power management applications
- Low and medium power DC/DC convertors
- Supply line switching
- Battery chargers
- Linear voltage regulation with low voltage drop-out (LDO).

DESCRIPTION

PNP low V_{CEsat} transistor in a SOT23 plastic package.
NPN complement: PBSS4350T.

MARKING

TYPE NUMBER	MARKING CODE(1)
PBSS5350T	ZD*

Note

1. * = p: Made in Hong Kong.
   * = t: Made in Malaysia.
   * = W: Made in China.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
V_{CEO}	collector-emitter voltage	–50	V
I_C	collector current (DC)	–2	A
I_{CRP}	repetitive peak collector current	–3	A
R_{CEsat}	equivalent on-resistance	135	mΩ

PINNING

PIN	DESCRIPTION
1	base
2	emitter
3	collector

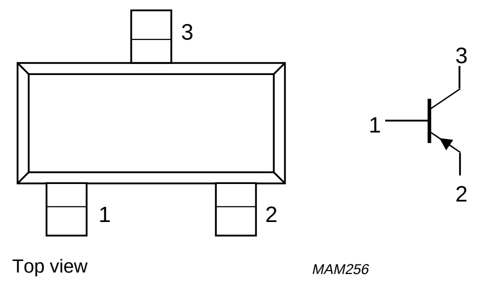


Fig.1 Simplified outline (SOT23) and symbol.

ORDERING INFORMATION

TYPENUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
PBSS5350T	–	plastic surface mounted package; 3 leads	SOT23

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	–	–50	V
V_{CEO}	collector-emitter voltage	open base	–	–50	V
V_{EBO}	emitter-base voltage	open collector	–	–5	V
I_C	collector current (DC)		–	–2	A
I_{CRP}	repetitive peak collector current	note 1	–	–3	A
I_{CM}	peak collector current	single peak	–	–5	A
I_B	base current (DC)		–	–0.5	A
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C; note 2	–	300	mW
		$T_{amb} \leq 25$ °C; note 3	–	480	mW
		$T_{amb} \leq 25$ °C; note 4	–	540	mW
		$T_{amb} \leq 25$ °C; notes 1 and 2	–	1.2	W
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		–65	+150	°C

Notes

1. Operated under pulsed conditions: pulse width $t_p \leq 100$ ms; duty cycle $\delta \leq 0.25$.
2. Device mounted on a printed-circuit board; single sided copper; tinplated; standard footprint.
3. Device mounted on a printed-circuit board; single sided copper; tinplated; mounting pad for collector 1 cm^2.
4. Device mounted on a printed-circuit board; single sided copper; tinplated; mounting pad for collector 6 cm^2.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ (j\text{-}a)}$	thermal resistance from junction to ambient	in free air; note 1	417	K/W
		in free air; note 2	260	K/W
		in free air; note 3	230	K/W
		in free air; notes 1 and 4	104	K/W

Notes

1. Device mounted on a printed-circuit board; single sided copper; tinplated; standard footprint.
2. Device mounted on a printed-circuit board; single sided copper; tinplated; mounting pad for collector 1 cm^2.
3. Device mounted on a printed-circuit board; single sided copper; tinplated; mounting pad for collector 6 cm^2.
4. Operated under pulsed conditions: pulse width $t_p \leq 100$ ms; duty cycle $\delta \leq 0.25$.

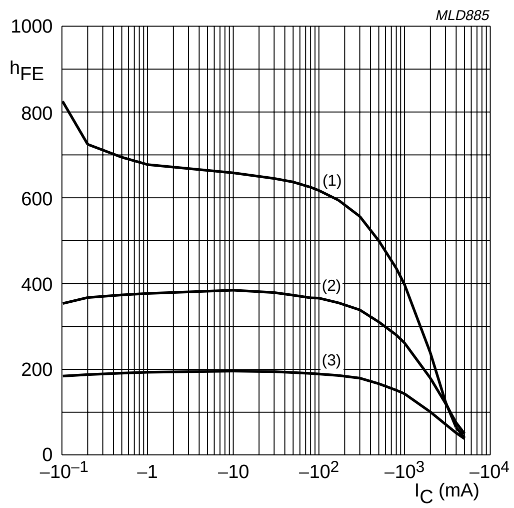
CHARACTERISTICS

$T_{amb} = 25\ °C$ unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CBO}	collector-base cut-off current	$V_{CB} = –50$ V; $I_E = 0$	–	–	–100	nA
		$V_{CB} = –50$ V; $I_E = 0$; $T_j = 150$ °C	–	–	–50	µA
I_{EBO}	emitter-base cut-off current	$V_{EB} = –5$ V; $I_C = 0$	–	–	–100	nA
h_{FE}	DC current gain	$V_{CE} = –2$ V; $I_C = –100$ mA	200	–	–	
		$V_{CE} = –2$ V; $I_C = –500$ mA	200	–	–	
		$V_{CE} = –2$ V; $I_C = –1$ A; note 1	200	–	–	
		$V_{CE} = –2$ V; $I_C = –2$ A; note 1	130	–	–	
		$V_{CE} = –2$ V; $I_C = –3$ A; note 1	80	–	–	
V_{CEsat}	collector-emitter saturation voltage	$I_C = –500$ mA; $I_B = –50$ mA	–	–	–90	mV
		$I_C = –1$ A; $I_B = –50$ mA	–	–	–180	mV
		$I_C = –2$ A; $I_B = –100$ mA; note 1	–	–	–320	mV
		$I_C = –2$ A; $I_B = –200$ mA; note 1	–	–	–270	mV
		$I_C = –3$ A; $I_B = –300$ mA; note 1	–	–	–390	mV
R_{CEsat}	equivalent on-resistance	$I_C = –2$ A; $I_B = –200$ mA; note 1	–	90	135	mΩ
V_{BEsat}	base-emitter saturation voltage	$I_C = –2$ A; $I_B = –100$ mA; note 1	–	–	–1.1	V
		$I_C = –3$ A; $I_B = –300$ mA; note 1	–	–	–1.2	V
V_{BEon}	base-emitter turn-on voltage	$V_{CE} = –2$ V; $I_C = –1$ A; note 1	–1.2	–	–	V
f_T	transition frequency	$I_C = –100$ mA; $V_{CE} = –5$ V; f = 100 MHz	100	–	–	MHz
C_c	collector capacitance	$V_{CB} = –10$ V; $I_E = I_e = 0$; f = 1 MHz	–	–	35	pF

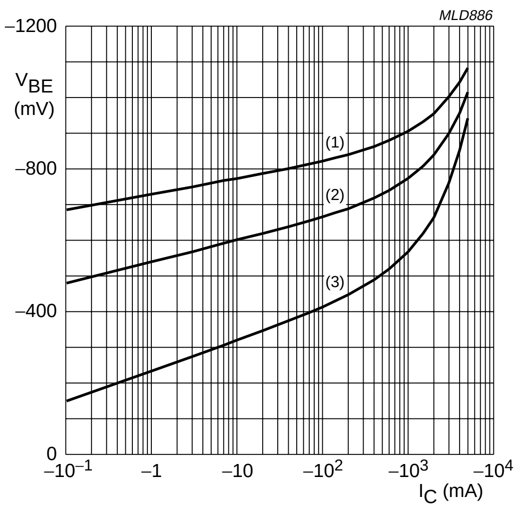
Note

1. Pulse test: $t_p \leq 300$ µs; $\delta \leq 0.02$.



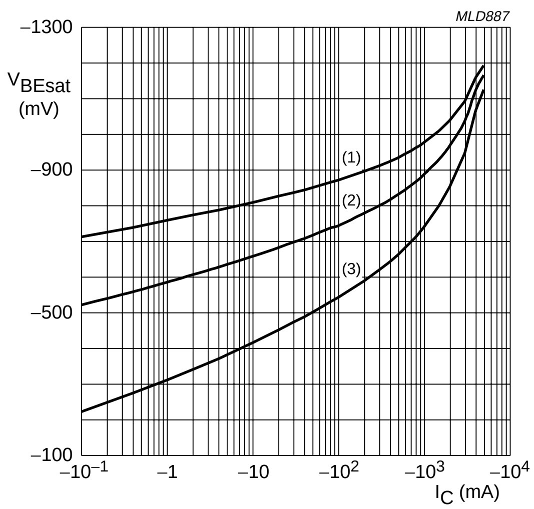
V_{CE} = −2 V.
(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = −55 °C.

Fig.2 DC current gain as a function of collector current; typical values.



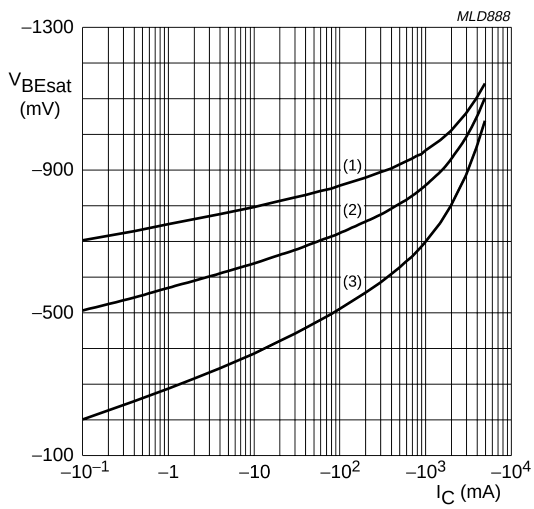
V_{CE} = −2 V.
(1) T_{amb} = −55 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = 150 °C.

Fig.3 Base-emitter voltage as a function of collector current; typical values.



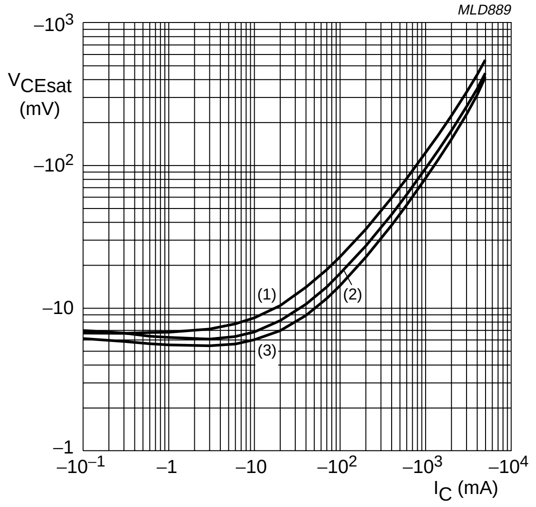
I_C/I_B = 10.
(1) T_{amb} = −55 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = 150 °C.

Fig.4 Base-emitter saturation voltage as a function of collector current; typical values.



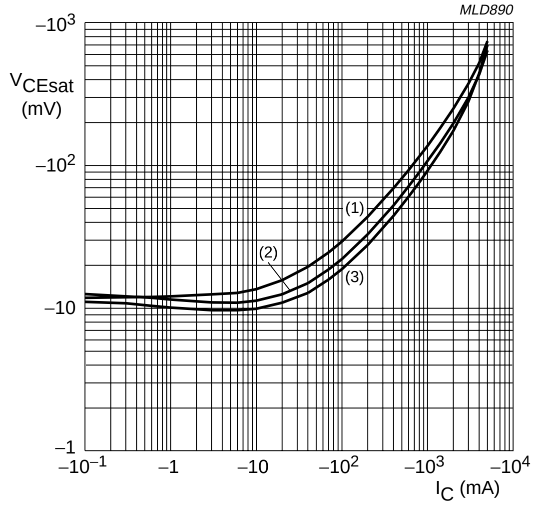
I_C/I_B = 20.
(1) T_{amb} = −55 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = 150 °C.

Fig.5 Base-emitter saturation voltage as a function of collector current; typical values.



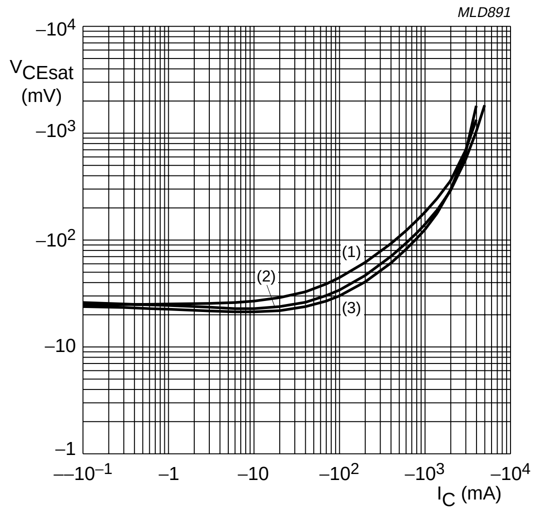
$I_C/I_B = 10$.
(1) $T_{amb} = 150$ °C.
(2) $T_{amb} = 25$ °C.
(3) $T_{amb} = -55$ °C.

Fig.6 Collector-emitter saturation voltage as a function of collector current; typical values.



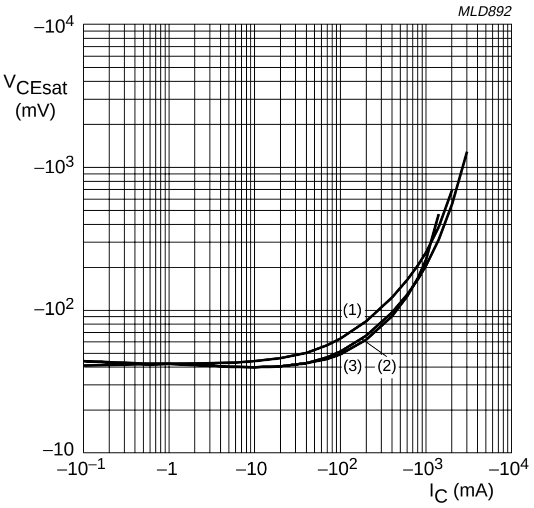
$I_C/I_B = 20$.
(1) $T_{amb} = 150$ °C.
(2) $T_{amb} = 25$ °C.
(3) $T_{amb} = -55$ °C.

Fig.7 Collector-emitter saturation voltage as a function of collector current; typical values.



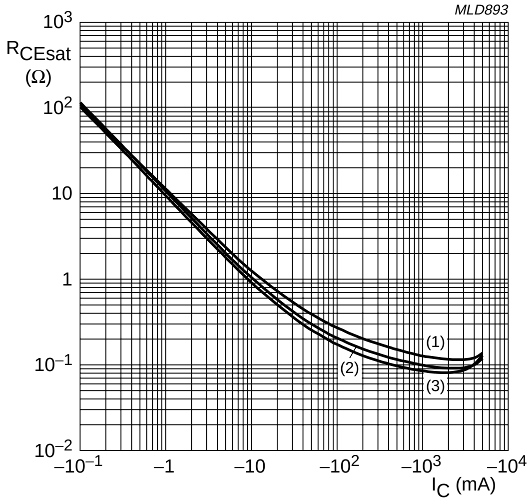
$I_C/I_B = 50$.
(1) $T_{amb} = 150$ °C.
(2) $T_{amb} = 25$ °C.
(3) $T_{amb} = -55$ °C.

Fig.8 Collector-emitter saturation voltage as a function of collector current; typical values.



$I_C/I_B = 100$.
(1) $T_{amb} = 150$ °C.
(2) $T_{amb} = 25$ °C.
(3) $T_{amb} = -55$ °C.

Fig.9 Collector-emitter saturation voltage as a function of collector current; typical values.



$I_C/I_B = 20$.

(1) $T_{amb} = 150$ °C.

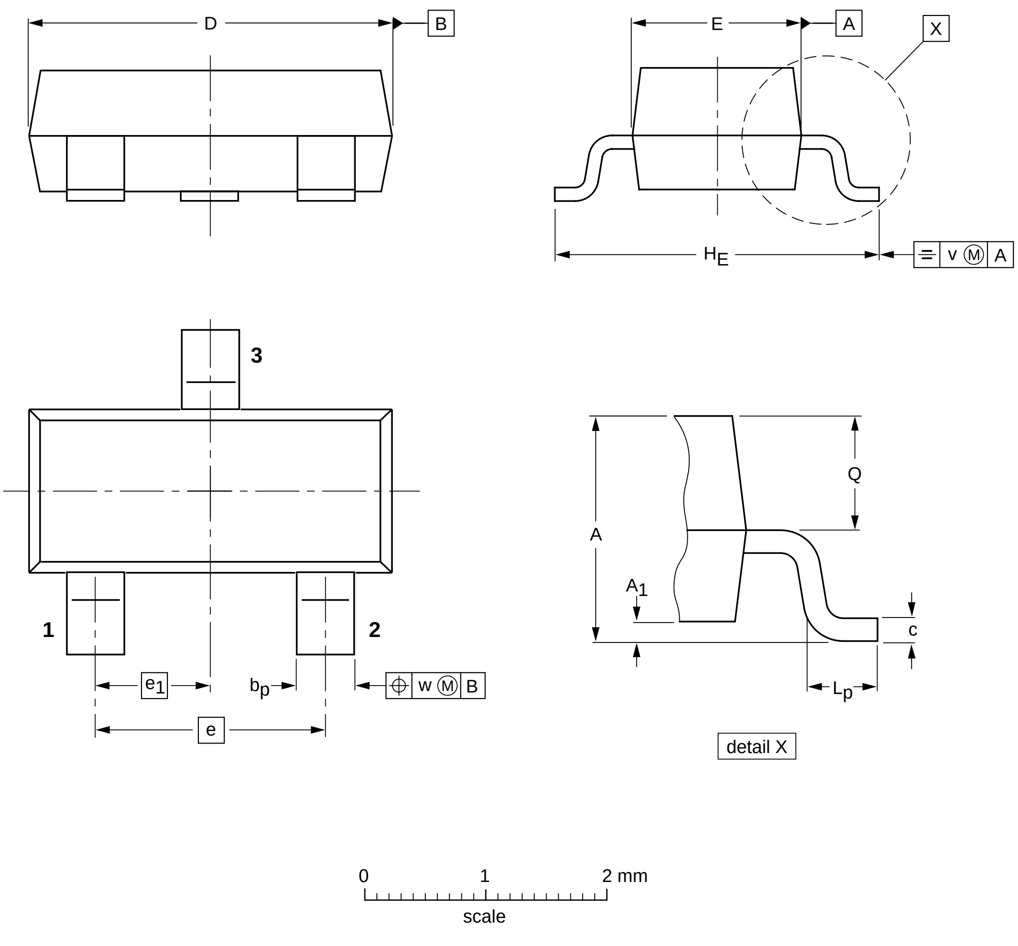
(2) $T_{amb} = 25$ °C.

(3) $T_{amb} = -55$ °C.

Fig.10 Equivalent on-resistance as a function of collector current; typical values.

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads **SOT23**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1 max.	b_p	c	D	E	e	e_1	H_E	L_p	Q	v	w
mm	1.1 0.9	0.1	0.48 0.38	0.15 0.09	3.0 2.8	1.4 1.2	1.9	0.95	2.5 2.1	0.45 0.15	0.55 0.45	0.2	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT23		TO-236AB				~~97-02-28~~ 99-09-13

DATA SHEET STATUS

LEVEL	DATA SHEET STATUS(1)	PRODUCT STATUS(2)(3)	DEFINITION
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3. For data sheets describing multiple type numbers, the highest-level product status determines the data sheet status.

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Limiting values definition — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

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